INDEX TO VOLUME XLIV.

ELECTRICAL REVIEW

JANUARY 2 TO JUNE 25, 1904

Articles marked * are illustrated; (E) indicates "Editorial"; (P) indicates notes under "Recent Electrical Patents"; (R) indicates "Review of Current Engineering Literature."

A

Abyssinian telephones..... 942
Accident on the New York Elevated, an (E).. 717
Accurate measurement of small resistances with the Kelvin double bridge, the, by W. Jaeger, S. Lindeck and H. Diesselhorst, translated by M. G. Lloyd*.....4, 64, 96
Action of light on germ diseases..... 3
Action of light on the speed of formation of accumulators, the (R)..... 336
Action of radium bromide on the electrical resistance of bismuth..... 391
Action of radium, Rœntgen rays and ultra-violet light on minerals and gems..... 176
Adaptability of electric driving, the (R).... 671
Advance in prices of platinum..... 604
Aim of the ELECTRICAL REVIEW, the (E).... 37
Alessandro Volta, letters of..... 926
Alloy, a new..... 450
Alternating-current apparatus to be given a working trial..... 801
Alternating-current induction meter (P)*... 23
Alternating-current motors (E)..... 199
Alternating-current railway motor, the, by Charles P. Steinmetz*.....215, 262
Alternating-current railway system, the possibilities of an (E)..... 93
Alternating-current series motor, the, by F. D. Newbury*..... 203
Alternating-current, single-phase railway motor, some possibilities of, the, by A. H. Armstrong*..... 111
Aluminum electrolytic condenser..... 631
Aluminum electrolytic condenser, the (E)... 650
Aluminum electrolytic condenser, the, by C. I. Zimmerman*..... 657
Amalgamated Copper Company wins copper mine case..... 219
American Association for the Advancement of Science..... 115
American Electrochemical Society, by Henry S. Carhart..... 357
American Electrochemical Society, New York section..... 253
American Institute of Electrical Engineers.. 218, 284, 368, 511, 600, 663, 795, 906
American Power-Boat Association, the race meet of the..... 239
American River Electric Company's power plant on the south fork of the American river, the (R)..... 397
American school of correspondence, at the Armour Institute of Technology, Chicago, Ill. 563
American Telephone and Telegraph Company, annual report of the..... 516
Analogies between radioactivity and the behavior of ozone..... 391
Annual dinner of the American Institute of Electrical Engineers...115, 130, 181, 214, 293
Annual field day..... 996
Annual meeting of the American Institute of Electrical Engineers (E)..... 718
Annual meeting of the American Institute of Electrical Engineers.....722, 795
Annual meeting of the Joseph Dixon Crucible Company, the..... 676
Annual meeting of the New York Electrical Society..... 972
Annual reception of the American Institute of Electrical Engineers, the..... 78
Annual report of the New York & New Jersey Telephone Company..... 318
Apparatus for perforating glass bulbs (P)*... 703
Apparatus for the simultaneous detection of the α and β-rays of radium (R)..... 522
Apparatus for transmitting writings and drawings telegraphically (R)..... 922
Applications of electricity to metallurgy, the, by J. W. Richards..... 735
Arctic expedition, a new..... 877
Around the intra-mural, by F. L. Merrick.... 546
Arnold electropneumatic railway system, its application and experiments therewith in connection with the Lansing, St. Johns & St. Louis Railway*..... 13
Arnold electropneumatic railway system, the (E)..... 38
Arrangement for exact standardization of electrometers for electrical measurements and its use for the absolute measurement of very small currents (R)..... 266
Articulation by flexible plates..... 69
Asbestos and its uses (R)..... 790
Atmospheric electricity (R)..... 305
Atoms and molecules (E)..... 433
Augustus Lowell laboratories of electrical engineering of the Massachusetts Institute of Technology*..... 472
Austria, electrical developments in..... 153
Austro-Germanic electric trust..... 63
Automatic apparatus for regulating generator and feeder potentials, by E. J. Bechtel*.. 19
Automatic circuit closer (P)*..... 562
Automatic electric switch (P)*..... 186
Automatic gas pump, an..... 841
Automobile as an auxiliary for the railroad, the..... 516
Automobiles, improvement in electric (P)*.. 265
Automobile parade, the (E)..... 684
Automobile parade..... 696
Automobile show, fourth annual, at Madison Square Garden..... 147
Automobile show in New York, the (E)..... 130
Automobile show, Madison Square Garden, New York city..... 122
Automobile, stoning the (E)..... 857
Automobile train, an..... 477
Automobiles and the hay crop (E)..... 37

B

Baltimore, the conflagration at..... 247
Battery, exciting fluid for (P)*..... 989
Behr mono-rail, the..... 744
Belgian Society of Engineers..... 181
Bell, new form of electric (P)*..... 187
Bell, Professor, and his kites, by Waldon Fawcett*..... 779
Benzine fires (R)..... 990
Berlin, a power, light and heat plant at (R).. 81
Berlin exchange No. 4, new telephone equipment at the (R)..... 396
Berlin teletyping central station, by Dr. A. Gradenwitz..... 553
Bethell, Mr. U. N..... 477
Between conventions (E)..... 850
Bitumen in insulating compositions..... 77
Black oxide of manganese..... 79
Blast-furnace gas engines (R)..... 791
Blondel arc lamp, the*..... 984
Blondel arc lamp, the (E)..... 970
Blondlot N-rays, the (R).....486, 522
Blowing of the fuse, the (E)..... 384
Blowout chute (P)*..... 924

BOOK REVIEWS.

Alternating Currents, Their Generation, Distribution and Utilization. Hanchett 449
Architectural Perspective for Beginners. Wright..... 273
Beginners Manual of Submarine Cable Testing. Baines..... 174
Cassell's Popular Science. Galt..... 366
Compendium of Drawing..... 868
Conduction of Electricity through Gases. Thomson..... 78
Conversion Tables. Hering..... 868
Dynamo, the. Hawkins and Wallis..... 78
Electric Lighting and Power Distribution. Maycock..... 78
Electric Traction. Rider..... 366
Electrical Engineering Experiments and Tests of Direct-Current Machinery. Sever..... 746

BOOK REVIEWS—*Continued.*

Electrician Electrical Trades Directory and Handbook for 1904..... 448
Electricity and Matter. Thomson..... 671
Essais Industriels des Machines Electriques et des Groupes Electrogenes. Loppe..... 671
Factory Manager and Accountant, the. Arnold..... 174
Fowler's Electrical Engineer's Year Book. 78
Free-Hand Lettering. Wilson..... 174
Handbook for the Electrical Laboratory and Testing-Room. Fleming..... 746
Hyde's Telephone Troubles and How to Find Them. Hyde..... 448
La Telegraphie Sans Fil. Broca..... 671
Lecons d'Electrotechnique. Janet..... 366
Localization of Faults, the. Raphael.... 366
Locomotive Simply Explained, the. Lake. 273
Maver's Wireless Telegraphy. Maver... 449
Modern Wiring Diagrams and Descriptions for Electrical Workers. Horstmann and Tousley..... 174
Notes on Electric Railway Economics and Preliminary Engineering. Gotshall... 766
Practical Lessons in Electricity..... 174
Simple Experiments in Static Electricity. Ball..... 448
Telephony. Abbott..... 217
Testing of Electromagnetic Machinery and Other Apparatus. Swenson and Frankenfield..... 746
Theory of the Lead Accumulator, the. Dolezalek..... 868
Treatise on Friction and Lost Work in Machinery and Mill Work. Thurston.. 174
Twentieth Century Handbook for Engineers and Electricians. Swingle, Horstmann and Tousley..... 637
X-rays Simply Explained. Howgrave-Graham..... 487
Boosters, means for controling (P)*..... 302
Boston Branch of the American Institute of Electrical Engineers..... 442
Brake handle (P)*..... 924
Breakdowns of electrical systems in England. 56
Breakdown test of the Nernst lamp, a (E)... 762
Bristol, England, switchboard fire, the (R)... 189
British engineering standards committee..... 324
British Institution of Electrical Engineers, the 273
British National Physical Laboratory, the electrical work of the..... 545
British street railways..... 565
Brush-holder (P)..... 367
Bucholtz steam turbine, the..... 191

C

Cable communications with Japan*..... 448
Cable cutting..... 845
Cable ship on the Amazon, experience of a (R) 922
Cable steamer Pacific, the (R)..... 922
Cableway over the Andes, a..... 797
Calcium carbide for raising vessels..... 458
Calculation of transmission lines, by Alton D. Adams..... 236
Calendar of invention and discovery, a..... 271
Canadian commission on electric smelting, report of the..... 938
Canadian commission to investigate electric smelting abroad..... 192
Canadian electric railways..... 174
Carbon brush, a new type of..... 928
Carbon resistance, method of making (P)*... 485
Carborundum..... 601
Car heaters (E)..... 166
Care and management of storage batteries (E) 129
Care and management of storage batteries, by Edward Lyndon*..131, 169, 201, 249, 287, 317
Cascade mounting of motors for plate rolls (R) 452
Case School of Applied Science, the..... 513
Cat electricity causes catastrophe..... 219
Cavitation in lubrication..... 9
Central Electric Supply Company's power station, the (R)..... 878

3 2357

Central station breakdowns (E)..... 130
Central station fires (E)..... 534
Central station heating, by W. H. Schott.... 254
Chesapeake & Potomac telephone system restored 398
Chesapeake & Potomac Telephone Company, the new general manager of the..... 517
Chevres hydraulic station, near Geneva, the, by B. F. Hirschauer*..... 138
Chicago & Alton's new line..... 747
Chinese telephone sign, a*..... 442
Cibiria, telegraphy in, by L. Lodian*..... 594
Cincinnati section of the American Institute of Electrical Engineers.....192, 369
Circuit-breaker (P)*..... 989
Circuit-breaker, automatic two-pole (P)*.... 23
Circuit-closer and breaker (P)*..... 302
Civil engineers and the Carnegie gift..... 391
Civil service examination for electrical engineers 722
Clarkson School of Technology..... 746
Class of 1893, Massachusetts Institute of Technology 168
Coal or water (E)..... 533
Coil windings for electrical purposes, by Richard Varley and Charles R. Underhill*... 256
Colored sign lamp (P)*..... 408
Combustion motor, lines of progress in the efficiency in the internal (R)..... 266
Commercial tests of materials..... 480
Commutator lead (P)*..... 367
Complete combustion of coal..... 564
Complexities of the central station (E)..... 350
Compound locomotives in France (R)..... 602
Compounding three-brush dynamos (R)..... 922
Concrete railway ties..... 286
Conductivity of the atmosphere at high voltages (E)..... 349
Conductivity of the atmosphere at high voltages, by H. J. Ryan*.....362, 402
Conductivity produced in rarefied gas by an incandescent cathode (R)..... 637
Conductor and coil (P)*..... 485
Conduit work at the new power-house of the Edison Electric Illuminating Company, Boston, Mass.*..... 358
Congress of Houille Blanche, report of the... 110
Consolidation of associations of Southern railway and lighting men..... 747
Construction apparatus wanted. A. De Permentier 298
Continuous-current system and the single-phase system for electric traction (R).. 847
Continuous-current transformers (R)..... 790
Continuous electrical service..... 284
Contribution to the study of the electrical arc, a, by W. S. Weedon*..... 622
Contribution to the theory of the regulation of alternators, by H. M. Hobart and F. Punga* 664, 691
Controller (P)*..... 186
Controllers, electric car (E)..... 233

CONVENTIONS.

American Association for the Advancement of Science..... 115
American Electrochemical Society..... 265, 398, 514, 597
American Society of Mechanical Engineers 765, 921
American Street Railway Association.... 632
Canadian Electrical Association.....661, 949
German Electrochemical Society, the.... 787, 621, 919
Independent Telephone Association of Wisconsin 170
Indiana Independent Mutual Telephone Association 962
Iowa Electrical Association..... 702
Master Car Builders' Association..... 988
National Electric Light Association.... 181
National Association of Manufacturers of the United States..... 747
National Electrical Contractors' Association 847
National Electric Light Association..793, 811
New York State Independent Telephone Association 938
Northwestern Electrical Association..... 122, 147, 177
Ohio Independent Telephone Association. 334
United Electrical Contractors' Association 151
Wisconsin Telephone Association..... 300
Convention exhibit, a..... 705
Cooper Hewitt mercury vapor lamp, by P. H. Thomas 446
Copper (E)..... 385
Copper ores and their physical appearance (R) 336
Cornwall canal, electrical equipment for, by F. H. Leonard, Jr..... 909
Correction, a. H. L. Joly..... 504
Cost of street lighting (R)..... 452
Criticism on single-phase traction, a (R)..... 990
Cross-ties (E)..... 892
Curing and preserving meats electrolytically (P)* 877
Cuba, proposed electric railway in..... 261

D

Damping device, a..... 838
Danger from large gas mains (E)..... 615
Dangers of illuminating gas, the (E)..... 316
Dartmouth, England, the new station at, by Frank C. Perkins..... 172
Data and tests on a 10,000-cycle-per-second alternator, by B. G. Lamme*..... 839
Deflector for fan motors (P)*..... 601
De Forest wireless telegraph system, the.... 800
Demonstration of magnetostriction (R)..... 748
Department of international research in terrestrial magnetism of the Carnegie Institution 632
Design of electrical machinery, notes on (R). 791
Design of small dynamos (R)..... 670
Destruction by fire of some of the property of the American Institute of Electrical Engineers 12
Destructor of the metropolitan borough of Hackney, England, the electricity works and (R)..... 522
Detector, a novel wave (R)..... 267
Detector (P)*..... 669
Developments in petroleum during 1902..... 566
Development of the tangential water-wheel, the (R)..... 305
Dielectric hysteresis, notes on..... 318
Differential or localized electroplating (R)... 117
Dinner, the Institute (E)..... 130
Dinner of the American Institute of Electrical Engineers, annual.....181, 214, 293
Diplomatic and consular service of the United States 181
Direct-current systems of electric drive, by W. A. Dick*..... 944
Directors' nominees of the American Institute of Electrical Engineers..... 634
Dispersion of fogs, the (E)..... 385
Disruptive discharges at very high voltages (R) 670
Dissociation by means of the alternating electric current, by W. H. Davis..... 626
Distribution of light from incandescent lamps, the (R)..... 152
Dock street substation of the Schenectady Railway Company, the new*..... 627
Does not like the electric light..... 552
Doherty gold medal competition, the..... 274
Do the rails of electric tramways conduct? (R) 569
Drive factories electrically and avoid floods (E) 282
Dustless roads in France..... 744
Dynamo brush (P)*..... 451
Dynamo, continuous-current (P)*..... 989
Dynamo testing machine, a new*..... 776

E

Earth connections (R)..... 568
Earth's permanent magnetic field, the physical decomposition of the (R)..... 152
Eddy currents in cable sheaths (E)..... 719
Eddy currents in dynamo machines (R)..... 337
Edgar, Mr. Charles L.*..... 794
Edinburgh, incandescent lamps for..... 147
Edison (E)..... 281
Edison accumulator, the*..... 356
Edison Electric Illuminating Company of Boston, new generating station of the*..... 767
Edison medal, the..... 696
Edward Weston*..... 745
Effect of the Russo-Japanese war on copper.. 398
Effect of the selenium cell on photographic plates, the (R)..... 990
Efficiency and color of osmium lamps, the (R) 370
Efficiency of the osmium lamp, the (E)..... 351
Eiffel tower in wireless telegraphy, the..... 776
Electric advance, the..... 742
Electric arc between mercury and carbon, the (R) 991
Electric brakes (E)..... 892
Electric cables in mining..... 468
Electric cableway over the Zambesi river (R). 748
Electric Club Journal..... 11
Electric coupling of dynamos driven by single-acting steam turbines (R)..... 24
Electric fire pumps (E)..... 970
Electric haulage in mines (R)..... 560
Electric heating systems (R)..... 704
Electric lighting in photographic laboratory.. 489
Electric lighting of trains..... 57
Electric lighting, some notes on, by C. L. Edgar 41
Electric locomotive for the New York Central, the* 871
Electric locomotives, by F. A. Scheffler..... 954
Electric locomotives for the New York Central (E) 891
Electric motors wanted in France..... 425
Electric plant of a piano factory (R)..... 337
Electric power distribution in England (R).. 956
Electric power era in Scotland..... 986
Electric power for railways, by B. S. Lanphear 285
Electric power in mines (E)..... 383
Electric pump for switching mechanism (P)*. 409
Electric railroads in Peru..... 642
Electric railway from Rome to Naples, an... 587
Electric smelting experiments for the manufacture of ferro-nickel from pyrrhotite, by E. A. Sjostedt*..... 720
Electric timing arrangement on the "Cresta," St. Moritz (R)..... 603
Electric traction for railways (R)..... 956
Electric traction in 1903, by Dr. Louis Bell.. 49
Electric traction with alternating currents, by A. C. Eborall*..... 133
Electric traction system, a new (R)..... 188
Electric tramways and railways in Nice, France 565
Electrical and mechanical equipment of a modern European theatre, the, by Franz Koster* 729
Electrical anemometry in the sea coast artillery service, by M. C. Sullivan*..... 449
Electrical driving in India..... 447
Electrical engineering laboratory of the Northampton Institute, England (R)..... 397
Electrical equipment for Cornwall canal, by F. H. Leonard, Jr.*..... 909
Electrical equipment of a battleship, the (R). 336
Electrical equipment of the Great Western Railway 355
Electrical exposition at Warsaw..... 402
Electrical fires (R)..... 486
Electrical industry in Great Britain..... 791
Electrical manufacture of steel, the, by Gustave Gin*.....617, 651
Electrical men enjoy planked shad..... 921
Electrical methods of measuring temperature 478, 569
Electrical mining notes, by W. B. Clarke..... 357
Electrical mining notes, by Sydney F. Walker 104, 148, 351, 399, 788
Electrical nomenclature..... 843
Electrical notes from Europe, by C. L. Durand 260, 560, 914
Electrical notes from India, by A. C. Hobble.. 942
Electrical opportunities in Paraguay..... 675
Electrical oscillations, a new method of detecting, by J. A. Ewing and L. H. Walter*.. 467
Electrical patents in 1903, by E. G. Siggers*.. 151
Electrical power in British shipyards (R)... 453
Electrical reforms (E)..... 500
ELECTRICAL REVIEW, the aim of the (E)..... 37
Electrical situation in Baltimore, the..... 513
Electrical speed indicators..... 153
Electrical terms (E)..... 809
Electrical transmission of power as an aid to greater economy in works and factories, by G. H. Bowden..... 330
Electrical undertakings in England..... 510
Electrically operated auxiliary water supply system, an*..... 369
Electrically operated submarine mines, by Waldon Fawcett*..... 906
Electricity at the Louisiana Purchase Exposition* 893
Electricity in car shops..... 642
Electricity in illumination and its relation to the fire hazard (E)..... 2
Electricity in Japan..... 453
Electrification of Great Western Railway, England 174
Electrification of the Liverpool & Southport Railway, England*..... 542

Electrification of the tunnels under the Alps. 696
Electrifying the steam locomotive (E)..... 166
Electro-capillarity (R)..... 397
Electrochemical equivalent of silver, the (E). 283
Electrode for vapor electric apparatus (P)*.. 877
Electrogoniometer, an (R)..... 602
Electrolytic anti-friction metal, an (R)..... 80
Electrolytic cell for the production of bleaching solution, two new forms of..... 148
Electrolytic galvanizing..... 876
Electrolytic iron, by C. F. Burgess and Carl Hambuechen 689
Electrolytic rectifier, the action of the (E).. 234
Electrolytic rectifier and interrupter, an..... 239
Electromagnet (P)*..... 451
Electromagnetic clutches and speed gears (R) 636
Electromechanical coupling, an..... 468
Electrons in metallic conduction (R)..... 371
Electrophysical research (R)..... 396
Electropneumatic railway system, the Arnold (E) 38
Electrostatic and electromagnetic separation of minerals (R)..... 370
Electrostatic capacity of wires, the, by George D. Shepardson*..... 973
Electrostatic revolving field, the production of an (R)..... 846
Elements and compounds (E)..... 936
Employment of water power to provide electrical energy for use on farms, the (R).. 304
Engineering Building, report on the..... 77
Engineering Building, the (E)..... 431
Engineering Building, the.....434, 776
Engineering, the commercial side of (R).... 116
Engineer's fee, the (E)..... 810
Erie Railroad, the opportunity of the (E)... 165
Ethics of fakes, the (E)..... 616
Europe, electrical notes from, by C. L. Durand 260, 560, 914
Europe, the progress of electrical development in 1903 in, by C. L. Durand..... 70
European electrical inventions..... 202
European practice in the construction and operation of high-pressure transmission lines and insulators, by Guido Semenza.. 394
Examination for assistant electrical engineers 398
Expansion of the Allis-Chalmers Company, the 334
Experience with high-tension transmission lines (R)..... 956
Experimental determination of the electrical field within an electrolyte (R)..... 846
Experimental determination of the form of alternating currents, the..... 776
Experimental law for the electrical transport of dissolved salts, an..... 447
Experiments on eddy currents, by W. M. Thornton*.....167, 211
Experiments with a new primary cell..... 732
Exports of manufactured copper..... 402
Exposition calendar, a fine..... 170
Exposition, electricity at the Louisiana Purchase* 893

F

Factories, purchased electric power in..... 863
Faintly luminous bodies affected by a non-uniform magnetic field (E)..... 350
Faraday Society, the.....391, 566, 686, 832
Farmers' telephone service..... 676
Fan, electric (P)*..... 744
Finsen light treatment..... 247
Fire at Baltimore, the (E)..... 233
Fire at Sandringham House, England, not caused by electricity, the..... 78
Firing-gear for breech-loading guns (P)*.... 264
Flaming arc lamp, the (E)..... 350
Flooded motors..... 337
Flywheels, notes on, by H. H. Barnes, Jr.*... 781
Fog prevention by electricity..... 9
Food conservatory, the electrical equipment of a, by W. C. Marlow*..... 54
Foolish practice, a (E)..... 719
Foreign electrical engineers, to welcome..... 844
Fort Wayne series alternating system of street arc lighting*..... 844
Free lectures..... 423
Free lectures on electrical engineering under the auspices of the New York department of education..... 79
French automobile show, by C. L. Durand*.. 175
Fuel economy in steam plants (R)..... 749
Fuel economy (E)..... 761
Furnace, a new electric..... 900
Furnace combustion, the control of (R)..... 847

G

Gas and electric light in Massachusetts..... 510
Gas engine for central station service, the, by Ralph D. Mershon*..... 392
Gas explosions (R)..... 522
Gas pipe, copper and coal (R)..... 267
Gas pipes in cities (E)..... 94
Gas power for central stations, by J. R. Bibbins* 60
General Electric Company, the annual report of the..... 733
General Electric Company wins lamp suit.... 246
General diagram for alternators, a*..... 726
Generating apparatus for Glasgow..... 192
Generating system, electric (P)*..... 743
German cable, the new..... 22
Germany, distribution of electrical energy in (R) 221
Gilbert, of Colchester, father of electrical science 22
Gin process for producing steel electrically, the (R)..... 189
Glass industry, recent progress in the (R)... 221
Glower holder for electric lamps (P)*..... 792
Good roads (E)..... 129
Great Northern & City Railway, of London, the rolling stock of the..... 119
Great Northern & City Railway, the (R).... 304
Grounding of secondaries, the, by F. B. Badt. 299
Grounding the neutral on high-potential alternating-current generators, the advisability and methods of, by G. N. Eastman*..... 903
Group switches in large power plants, the use of, by L. B. Stillwell..... 439
Guard wires for transmission lines, by Alton D. Adams..... 106
Gutta-percha in the Philippines..... 832

H

Happy New Year, a (E)..... 3
Handsome advertising automobile, a..... 754
Hay crop, automobiles and the (E)..... 37
Heat transference through boiler plates (R). 152
Heater, a new electric (P)*..... 79
Heater, electric (P)*..... 743
Heating apparatus (P)*..... 367
Heating apparatus, method of making (P)*. 955
Heating element, electric (P)*..... 23
Hertz waves on sources of light having small intensity, action of (R)..... 923
Hidden correspondent, the (E)..... 762
High-frequency currents by means of telephone 618
High-pressure transmission meeting at Chicago 725
High-speed steam railway service..... 434
High-tension condenser (P)*..... 955
High-tension hydroelectric plants in Roumania and Switzerland, by Frank C. Perkins*.. 321
High-tension substations, recommendations in reference to the construction of (R).... 878
High-tension transmission meeting at Chicago 949
High-tension transmission papers at the American Institute of Electrical Engineers.... 439
Hoist by his own petard (E)..... 166
Holtz machines, a few experiments with, by Samuel Sheldon*..... 251
Homes of the engineering societies (R)..... 117
Horse and urban developments, the (E)..... 165
Hydraulic analogy of the aluminum electrolytic condenser, by C. I. Zimmerman*..... 660
Hydroelectric installation at Newry, England (R) 486
Hydroelectric power plant at Zwolfmalgreien, in Tyrol, Austria, by Franz Koster*.... 505
Hydroelectric station in Switzerland, a new.. 361
Hydroelectric stations of the Alta-Italia Company, the (R)..... 602
Hydroelectric station of Champ, the, by Enrico Bignami* 538
Honoring a distinguished newspaper man.... 696
Hot-wire ammeter for measuring very small alternating currents, a..... 657

I

Illuminating a summer resort..... 800
Imposition on the General Electric Company. 634
Improved electric furnace, an..... 634
Improved method of charging internal combustion machines (R)..... 790
Improvements in steam turbines..... 317
Improvements in steam turbines (R)..... 486
Incandescent lamp manufacturers meet again. 972
Incandescent lamp, new form of (P)*..... 989
Incandescent lamp, the (E)..... 283
Incombustible celluloid..... 733
Increasing the use of electric automobiles, by H. S. Knowlton..... 728
India-rubber in India..... 747
Industrial electrochemistry and electrometallurgy, by J. B. C. Kershaw..5, 53, 103, 137, 171, 205, 248, 292, 325
Industrial electrochemistry and electrometallurgy (E)..... 282

INDUSTRIAL SECTION.

Adjuster, a new form of incandescent lamp, M.-S. Co.*..... 84
Allen-Bradley controller, the, A. E. F. Co.* 992
Allis-Chalmers-Bullock organization..... 423
Alternating-current cranes, W. E. & Mfg. Co.* 338
Ammeter, a pocket, E. E. Mfg. Co.*..... 86
Andrae underground distribution box, J. A. & S. Co.*..... 754
"Anyun" high-voltage oil fuse, the..... 753
Apparatus for cleaning telephone switchboards* 374
Attachment plugs, H. T. P. Co.*..... 800
Automatic continuous-feed electric blueprinting machine, W. B. & E.*..... 30
Automatic lamp shade, an, G. I. A. L. Co.* 960
Automatic railway signal, the Harvey, E. B. 269
Battery fan outfit, a new, E.-M. Co.*.... 996
Block plant for Cleveland..... 27
Blue-printing machine, an electric, S. P. P. Co.*..... 271
Blue-printing outfits, G. E. Co.*..... 675
Breakdown test of the Nernst lamp, A. N. L. Co..... 801
Bristol's thermometer thermostat, B. Co.* 883
Burger gas engines, W. F. & M. Co.*.... 118
Cable hangers, H.-P., J. S. B. & Co.*.... 525
Canadian Westinghouse Company, Limited, the*..... 994
Carbon break circuit-breaker, a new, W. E. & Mfg. Co.*..... 307
Central station specialties, E. L. E. & M. Co.* 706
Circuit-breakers, a new line of, G. E. Co* 28
Combination plug and socket, W. H. R.*. 338
Combined punch and shear, C. W. Co.*.. 525
Compressed air power plant at the St. Louis Exposition, the, L. D. G. Co.*... 190
Convertible sleeping and parlor cars for electric railroads, H. P. C. Co.*..... 224
Cord adjusters, J. H. S.*..... 422
Creosoted timber, W. P. & C. Co..... 376
Cylinder oil, a device for saving, B. Mfg. Co.* 848
Dale Company, the evolution of the, D. Co.* 424
Dale wireless cluster, the, D. Co.*..... 676
Demand for conduit, the, S. V. C. Co.... 639
Diamond-bearing meter screw, J. W. S. Co.* 270
Diehl Manufacturing Company's fans for 1904, D. Mfg. Co.*..... 456
Direct-current switchboard instruments, W. E. & Mfg. Co.*..... 752
Direct-driven generators for power and lighting, W. E. Co.*..... 638
Duntley washable battery cell, C. S. B. Co.*..... 996
Dynamotors and motor-generators, H.-C. E. Co.*..... 927
Echo from the Baltimore fire, C. W. Co.. 608
Electric automobile test run, R. I. E. Co. 960
Electric cars for the New York Central, G. E. Co..... 84
Electric fans in New York theatres..... 996
Electric heater novelty, S. E. H. Co.*... 488
Electric light plant for launches and yachts, an, C. & F. Co.*..... 608
Electric motor, a new type of*..... 489
Electric power for factories..... 224
Electric Storage Battery Company, a new building for the, E. S. B. Co.*..... 82
Electric tower crane, G. E. I.*..... 374
Electric vehicle, new record for a long-distance run on a single charge in an. 84
Electrically driven centrifugal pumps, H. R. W. Co.*..... 607
Electrically equipped parlor car, B. & S. C. Co.*..... 571
Electrically operated air or steam whistle, an, E. A. Co.*..... 800
Electricians' tool chest, V. P. & H. Co.*. 674

INDUSTRIAL SECTION—*Continued.*

Enclosed arc lamp, a new type of, H. Mfg. Co.* ... 268
Enclosed removable fuse for moderate potentials, an ... 996
Facilitating telephone communication, a device for, M. H.* ... 155
Fans for 1904* ... 410
Fibre lamp shade, a new, A. D. Co.* ... 674
Fifteen-hundred-kilowatt alternator for St. Louis Exposition, N. E. Co.* ... 710
Fireproof wire, T.-H. D. Co.* ... 119
Fire pumping station for Philadelphia, individual, W. M. Co ... 270
Flush receptacles and plugs, H. Mfg. Co.* 605
Fostoria tipless lamp, the, F. I. L. Co.* ... 454
Frost storage battery grid, the, C. S. B. Co.* ... 850
Fuse plug cabinet panels, G. E. Co.* ... 605
Gas explosions and bituminized fibre conduit, A. C. Co ... 338
Gauge cock, the "P. B. H.," weighted, P. B. H.* ... 423
General catalogue of the Doubleday-Hill Electric Company, the new ... 751
General Electric Company at the New York automobile show, G. E. Co.* ... 154
General Incandescent Arc Light Company's fans for 1904, G. I. A. L. Co.* ... 455
Generators, eight-pole, engine-type, E.-P. E. Co.* ... 86
Gladstone-Lalande battery, the, B. S. Co.* 883
Gleason tube protector, the, J. L. G.* ... 801
Gold dredging, G. E. Co ... 457
Grand Rapids Automatic Telephone Exchange put into service, A. E. Co ... 119
Heany enclosed arc lamp, the, A. E. M. Co.* ... 29
High-pressure gas distribution by gas power ... 343
High-speed locomotive tests in Germany ... 962
High-speed motor-driven pumps, B. & K. S. P. W.* ... 993
High-tension strain insulator, V. M. L.* ... 571
High-voltage oil switches, S. E. Mfg. Co.* 798
Hobart Electric Manufacturing Company, reorganization of the, H. E. Mfg. Co ... 82
Hoist, a new electric traveling, N.-B.-P. Co.* ... 158
"Ideal" electric machinery, I. E. & Mfg. Co.* ... 306
Ideal bipolar steel frame motors, the, I. E. & Mfg. Co.* ... 490
Igniters, Apple, D. E. Mfg. Co.* ... 86
Impressive machine tool catalogue, an, N.-B.-P. Co ... 608
Incandescent lamp manufacturers and the patent situation ... 572
Incandescent lighting clusters, new form of, B. E. Mfg. Co.* ... 706
Increase in flywheel accidents, C. E.-S. Co.* ... 309
Increasing the value of manufacturing institutions, G. R. & Co ... 754
Isolated storage battery installation, S. S. B. Co.* ... 574
Keeler water-tube boiler, the, E. K. Co.* ... 574
Kellogg harmonic four-party system, the, K. S. & S. Co.* ... 880
Lamp guard, new type of, P. R. W. Co.* ... 191
Launch motors for the World's Fair, H. E. Co.* ... 526
Lightning arrester, "N. P.," W. E. & Mfg. Co.* ... 925
Line material for alternating-current railway service, E. P. M. Co.* ... 961
Long-scale portable instrument, W. E. & Mfg. Co.* ... 882
"Lorimer" system of machine telephony, the, A. M. T. Co ... 340
Lubricator, a double-ratchet, force-feed, L. Co.* ... 526
Mechanical draught at St. Louis Exposition, B. F. Co.* ... 961
Metaphone, the, E. U. Co.* ... 673
Metal-melting furnace, the Lunkenheimer, L. Co.* ... 82
Meters, a dial plate for electric* ... 120
Midget receptacle and plug, M.-S. Co.* ... 26
Milling and mining plants, extensive use of electricity in, S. L. Co ... 85
Milling machine, an electrically driven, C. M. M. Co.* ... 27
Milne patented water-tube boiler and superheater, M. B. Co.* ... 750

INDUSTRIAL SECTION—*Continued.*

Modern building, the illumination of, I. P. F ... 86
Monarch incandescent lamp, the, M. E. Mfg. Co.* ... 490
Motors and generators, new type, E. D. & M. W.* ... 85
Motor-driven buffing lathes and dry grinders, C. W. Co.* ... 753
Multi-current feed-water heater, B. & K. S. P. W.* ... 709
Multi-voltage electric generator, a new, W. E. & Mfg. Co.* ... 120
New type machines for the New England Motor Company, N. E. M. Co* ... 800
Novelties for electrical work, two, A. D. Co.* ... 606
Oil car circuit-breakers, H. C.-B. Co.* ... 524
Oil-grooving machine, a new, G. M. Co.* .. 488
"Phono-electric" wire, B. B. Co ... 85
Portable car telephones, S.-C. T. Mfg. Co 122
Portable centering device, a, F. H. H.* .. 454
Portable electrically driven grinder, H.-W. M. Co.* ... 28
Portable electric pumps ... 272
Portable lamp guard, C. Co.* ... 376
Portable power-factor meter, a new, W. E. & Mfg. Co.* ... 524
Portable voltage and series transformers, W. E. & Mfg. Co.* ... 491
Potential regulator for charging storage batteries, improved* ... 993
Power station operated by gas ... 224
Protection for a large and expensive power plant, C. E.-S. Co ... 850
Push-button telephones, A. P.-B. T. C.* .. 672
Railway telephones, new, M. & E. Co.* ... 570
Recent installation of Cooper Hewitt lamps, C. H. E. Co.* ... 706
Recent literature of the General Electric Company, G. E. Co.* ... 268
Regulating and reversing controllers, W. E. & Mfg. Co.* ... 375
Regulating and reversing controllers for machine tool service, W. E. & Mfg. Co.* 640
Reinsulating device for transmission systems, S. V. W.* ... 752
Repair of Philippine cables ... 85
Receiver, a new solid-face watch-case, E. G. L. Co.* ... 84
Robb-Mumford internally fired boiler, R.-M. B. Co.* ... 274
Rotary converters, modern developments in, B. E. Mfg. Co.* ... 121
Ruger gas engine, the, J. W. R. Mfg. Co * 269
Selective telephone system, a, N. S. Co ... 28
Shaw non-arcing lightning arrester, the, S. E. & Mfg. Co.* ... 848
Sign flashers, recent improvements in electric, R. E. F. Mfg. Co ... 85
Sign flasher, a new type of, R. Mfg. Co.* 573
Signal system, a simple electric railway, J. B.* ... 272
Small single-phase motors, G. E. Co.* ... 572
Solenoids and electromagnets, E. C. & S. Co.* ... 958
Some P. & S. specialties, P. & S.* ... 926
Sperry-Lyndon train lighting system, the* 225
Steam turbine power plant for Boston navy yard, W. M. Co ... 641
Supplies for exposition purposes ... 272
Switchboard for sugar refinery, W. E. Co.* ... 454
Ten-ton revolving ingot charging crane, C. W. Co.* ... 309
Testing set, a new, M. & R.* ... 751
Thirty-six-inch lathe driven through an all-geared head, A. T. W. Co.* ... 308
Three-bearing generators for gas engine plants, C. E. Co.* ... 960
Three-point autostarter, W. E. & Mfg. Co.* ... 925
Trains electrically lighted, all ... 422
Transformer primary cutout, W. E. & Mfg. Co.* ... 573
Triumph electrical apparatus, T. E. Co.* . 372
Trumbull magneto and battery switch, T. E. Mfg. Co.* ... 606
Twenty-four-inch motor-driven lathe, C. W. Co.* ... 190
Twin socket for incandescent lamp illumination, B. E. Mfg. Co.* ... 606
Turbo-electric apparatus for Manila, W. C. K. & Co ... 26

INDUSTRIAL SECTION—*Continued.*

Underground cables in Baltimore fire, S. U. C. Co ... 423
Universal portable and desk lamp, C. E. Co.* ... 962
Variable-speed motor for refrigerating apparatus, R. E. Co.* ... 269
Variable-speed motors for single voltage, C. E. Co* ... 376
Variable-speed induction motors, S. E. Mfg. Co.* ... 708
Voltaphone, the, S. E. Mfg. Co.* ... 83
Walker magnetic chucks, O. S. W. & Co.* 849
Wall receptacle, a flush, G. E. Co.* ... 225
Warner arc lamp, the, W. F. W.* ... 373
Warren rotary engine, R. E. Co.* ... 222
Westinghouse Electric and Manufacturing Company's fans for 1904, W. E. & Mfg. Co.* ... 455
Westinghouse-Parsons steam turbines, W. M. Co.* ... 156
Westinghouse turbines in a textile mill, W. M. Co ... 225
Willyoung universal ohmmeter and faradmeter, W. & G. Co.* ... 674
Wireless cluster, new type of, B. E. Mfg. Co.* ... 676
Wire-testing clip, F. D. F. Co.* ... 268
"Workwell" telephone, the, S. H. C. Co.* 641
Influence of light on the velocity of formation of storage battery plates (R) ... 704
Information regarding the World's Fair ... 752
International Association of Municipal Electricians ... 604
International Correspondence Schools at St. Louis, the ... 739
International electrical congress..117, 208, 565, 630, 861, 950
Interruption of the central station at La Haye, France, note on the (R) ... 336
Investigation of the causes of commutator sparking ... 584
Ionization of the air ... 633
Iridium ... 456
Iroquois theatre fire, the (R) ... 266
Iron alloys, new process for the manufacture of ... 246
Iron-wire rheostat, an (R) ... 670
Irrigation by means of electrically driven pumps ... 149
Italy, electric roads in ... 98

J

Joint meeting of British and American mechanical engineers ... 626
Joint meeting of electrical, gas lighting and railway associations ... 548
Journal of the British Institution of Electrical Engineers ... 355
Jungner alkaline cell, the (R) ... 305

K

Kelvin compass and sounding machine, improvement in ... 19
Kimberley mines, an electric pumping station for the, by Emile Guarini ... 243
Korea, electrical apparatus in ... 176

L

Laboratories for instruction in electrical engineering (E) ... 465
Laboratoire Central d'Electritite at Paris (R) 603
Labor and invention ... 176
Lamme single-phase motor, the* ... 243
Lamp regulation on electric cars (E) ... 499
Lamp renewals (E) ... 762
Lecture on the Edison storage battery ... 733
Lehigh University register ... 563
Lesson of interrupted service, the (E) ... 583
Letter from B. J. Arnold, a ... 12
Lieb, Mr. John W., Jr.* ... 797
Life and efficiency of the Nernst lamp (E) ... 432
Lighting and power system, an electric (P)* 744
Lighting gas lamps at a distance (R) ... 704
Lightning arresters (E) ... 95
Line construction (E) ... 432
Lines of the Bell telephone companies, and international connections, the* ... 860
Liquid fuel burners (R) ... 705
Lithotype, the* ... 184
Localized wireless telegraphy ... 192

Loft buildings—electrical power desirable, by E. R. Knowles..... 515
Long life of an incandescent lamp..... 660
Long single-span bridge over the Miami river, a 454
Losses in porcelain insulators..... 423
Losses in the sheaths of alternating-current cables..... 724
Lost and unaccounted-for current, by C. W. Humphrey*..... 864
Lothian oil mine, electric power in a*..... 99
Louisiana Purchase Exposition, the (E)..... 683
Louisiana Purchase Exposition, the*..... 697

M

Machinery for Japan..... 723
Magnetic Club, an interesting meeting of the. 667
Magnetic separating apparatus (P)*..... 845
Magnetic tests of whole sheets of iron..... 357
Major wireless telegraph progress for the year 1903, by Joseph B. Baker..... 73
Manila's telephone service and conditions, by A. S. Riggs..... 943
Manufacture of steel in the electric furnace, the..... 330
Mariner's compass, the early history of, and the earliest knowledge of the magnetic declination according to Bertelli (R).... 487
Massachusetts Institute of Technology...521, 780, 827, 841
Maximum capacity of a lead accumulator (R). 636
Measuring instruments for alternating currents..... 876
Measurement of certain very short intervals of time, the (R)..... 705
Measurements of small inductances..... 653
Measurements of small resistances (E)..... 95
Measurement of the resistance of insulators during operation (R)..... 670
Mechanical and electrical equipment of the Sackett & Wilhelms Lithographing and Printing Company*.....206, 240
Medical practitioners, lectures to, on physics applied to medicine (R)..... 878
Meeting of electrical jobbers..... 633
Memorial to James Watt, a..... 746
Mercury arc lamp, for automatic lighting, a new (R)..... 846
Mercury arcs, phenomena in connection with.. 267
Mercury vapor lamp, a new..... 373
Mercury vapor lamp, a new*..... 587
Metal, another new..... 286
Method for the determination of coefficients of mutual induction, a (R)..... 486
Methods of charging for electrical energy, by Ellis H. Crapper..... 109
Methods of regulating the speed of continuous-current motors (R).....523
Method of winding for electric machine (P)*. 563
Metric system in England..... 635
Mexico, news from, Jos. Bannon.....361, 564, 593
Michigan Independent Telephone Association, meeting of the..... 391
Military telegraph corps, the..... 69
Mining installations of the Helios Electrical Company, the, by Emile Guarini*..... 386
Mining, the use of electric power in (E)..... 199
Mining, the use of electricity in (E)..... 315
Minor wireless telegraph progress for the year 1903, by Joseph B. Baker..... 400
Minor wireless telegraph progress..... 453
Misapplied methods (E)..... 809
Modern railway, light and power plant, a*... 435
Modified Morse key signaling apparatus (P)*. 187
More properties of N-rays..... 569
Motor drive, the (E)..... 684
Motor-driven machinery (R)..... 80
Motors (E)..... 683
Motor suspension for vehicles (P)*..... 955
Mount Blanc, electric power for tunneling... 212
Multiple supply electric railway system for heavy traffic (R)..... 25
Municipal economy, one method of securing (E)..... 935

N

National Bureau of Standards, the (E)..... 130
National Bureau of Standards, the, by Edwin F. Northrup..... 146
National Electric Light Association....136, 357, 484, 546, 634, 667, 685, 793, 811, 976
Naval control of wireless telegraphy (E).... 858
Naval observatory's new year's greeting to the world, the, by George C. Maynard..... 42
Need for research, the (E)..... 501
New cable in Venezuela..... 751
New factors in civil life (E)..... 615
New mineral from Ceylon, a (R)..... 670
New receiver for wireless telegraphy (R)... 636
New Richmond Roller Mills Company, the new electric station of the, by R. D. Thomas*..... 654
New uses for calcium carbide (E)..... 467
New year number of the ELECTRICAL REVIEW, the (E)..... 3
New York Central, the electric locomotive for the*..... 871
New York Electrical Society.....147, 247, 776
New York section of the American Electrochemical Society..... 181
Nitrates, electrical manufacture of (R)..... 452
Normal standard cell for technical laboratories, a (R)..... 704
Notes on the electrodeposition of cadmium and its alloys (R)..... 637
Notes on X-light, by William Rollins*...63, 136, 209, 324, 901, 947
N-rays, the, by J. B. Whitehead..... 433
N-rays of M. Blondlot, a search for the (R).. 116
N-rays, more surprising properties of (E)... 891

O

OBITUARY.
Allen, Jeremiah Mervin..... 89
Baldwin, Mrs. J. R..... 677
Barney, General C. H..... 127
Bogardus, Mr. Henry A..... 578
Clark, Mr. F. H..... 127
Clarke, Mr. John V..... 999
Connell, James A..... 89
Crandall, Mr. Chester D..... 578
Downs, Mr. William E..... 313
Forbes, Mr. J. M..... 348
Garrison, Mr. W. O..... 194
Gilbert, Mr. G. F..... 377
Grant, Mr. C. W..... 803
Hanna, Senator M. A..... 313
Hazzard, Mr. William Henry..... 229
Hefner-Alteneck, Dr. Freidrich von..... 194
Hickenlooper, Gen. A..... 803
Hinkley, Mr. J. W..... 647
Howard, Mr. Andrew..... 428
McMillan, Mr. W. G..... 348
Myers, Mr. J. A..... 931
O'Hara, Mr. J. B..... 464
Peck, Mrs. M..... 677
Perin, Mr. N..... 803
Richards, Mr. Herbert Taft..... 89
Sabold, Mr. F. W..... 677
Siemens, Mr. Frederick..... 887
Smith, Calvin Augustus..... 89
Spiles, Mr. W. W..... 127
Vilas, Royal Cooper..... 89
Wallace, Mr. William..... 856
Wilmot, Mr. Thomas J..... 593
Oil filter, a simple (R)..... 81
Oil mine, electric power in a Lothian*..... 99
Oil separator, an electrical..... 950
Oil switch for high pressures, by E. M. Hewlett..... 440
Opportunities in the electrical business, the, by George A. Damon..... 481
One-hundred-mile transmission line, a, by Robert Howes*..... 833
One or two motormen? (E)..... 970
Ore separator (P)*..... 521
Oscillograph, the use of the (E)..... 858
Output and design coefficient, the (R)..... 602
Overhead electric cranes in central stations (R)..... 370
Overhead tramway construction (R)..... 957
Overhead trolley in Monaco..... 155

P

Palmero-Rocca-Monreale electric railway, the (R)..... 790
Parallel operation of alternators (R)..... 523
Paris underground railway, improvements in the..... 258
Paris generating plant, a large, modern, by C. L. Durand..... 828
Parsons single jet disc turbine..... 709
Parsons vacuum augmenter, the*..... 954
Passing of the main belt, the (E)..... 431
Peaked wave apparatus (P)*..... 601
Philadelphia branch of the American Institute of Electrical Engineers..... 284
Photographic action of radium rays..... 284
Photographing alternating current waves with the new Duddell oscillograph, by Frank C. Perkins..... 7
Photometric tests on Nernst lamps (R)..... 80
Physico-Chemical Review, the..... 117
Plea on behalf of the consulting engineer, a.. 662
Pliers, a new design of (P)*..... 845
Polarization in Rœntgen rays (R)..... 568
Polyphase magneto-alternator (P)*..... 409
Portable electric drilling apparatus..... 265
Portable electric mining lamp, a..... 471
PORTRAITS.
Allan, Mr. J. B..... 887
Bennett, Mr. I. A..... 378
Bethell, Mr. U. N..... 477
Davis, Mr. E. H..... 811
Edgar, Mr. Charles L..... 794
Edison, Thomas Alva..... 293
Francis, the Hon. D. R..... 697
Gentry, Mr. W. T..... 127
Goldsborough, Prof. W. E..... 697
Howard, Mr. Hudson..... 428
Lieb, Mr. John W., Jr..... 797
Lyons, Mr. J. W..... 886
McMeen, Mr. S. G..... 579
Miller, Mr. Kempster B..... 579
Myers, Mr. J. A..... 931
Roosevelt, the Hon. Theodore..... 697
Weston, Mr. Edward..... 745
Possible method of determining the durability of book papers by exposing them to radium, William Rollins..... 584
Possibilities of electric traction, the (E).... 810
Power development at Kakabeka Falls, Canada (R)..... 25
Power development works at Niagara Falls, Ontario (R)..... 991
Power plans for the great falls of the Potomac, by J. E. Price..... 501
Power signaling on British railways..... 69
Pratt street power-house at Baltimore not destroyed by the fire..... 284
Predetermination of sparking in direct-current machines, by W. L. Waters*..... 824
Preliminary experiments on air friction, by W. Odell*..... 142
Preparation of materials for standard cells and their construction, by H. S. Carhart, and G. A. Hulett*..... 590
Preparation of standard cells (E)..... 582
Preservative properties of creosote, the..... 398
Problems of improving electric lamps, the, by Henry Noel Potter..... 763
Problems of improving electric lamps, the, a correction..... 876
Proceedings of the National Electric Light Association..... 273
Proceedings of the Ohio Electric Light Association..... 458
Process for the rapid formation of lead storage batteries (R)..... 705
Process of preparing storage battery plates (P)..... 451
Proctor theatres..... 422
Production of alternating current of high frequency (R)..... 748
Production of caustic soda and bleaching powder, Acker Process Company..... 749
Production of mica in 1902..... 567
Progress of electrical development in Europe in 1903, the, by C. L. Durand..... 70
Progress of electricity during 1903, the, by John Trowbridge..... 76
Promotion of business, the, by Arthur Warren 407
Proposed railway school for McGill University 273
Prosperity in the West..... 492
Protection of electric railway grade crossings (R)..... 990
Pupin, Dr. M. I., lectures before the New York Electrical Society..... 873
Purchased electric power in factories..... 863
Purdue University..... 747

Q

Queer and interesting old advertisement, a.. 621
Question for telephone men, a..... 545
Quartz-thread vertical force magnetograph, a 480

R

Radiation from an electron describing a circular orbit (R)..... 304
Radioactive experiment on cast iron, an interesting*..... 587
Radioactive phenomena, by H. F. Lowther... 662
Radioactive science, the present condition of (E)..... 384
Radioactivity for determining the capacity of condensers..... 685
Radioactivity of radium depend upon its concentration? does the, (R)..... 188
Radio-tellurium (R)..... 370
Radium, a new supply of, found..... 102
Radium-bearing mineral in Quebec..... 634
Radium, life history of (R)..... 923
Radium minerals in Quebec..... 780
Radium on metals, action of..... 861
Railless electric roads in Germany..... 884
Railways in Mexico..... 587
Railway system in which the trains do not stop, a..... 205
Railway systems, the possibilities of an alternating-current (E)..... 93
Railway tests at St. Louis (E)..... 761
Raising the efficiency of power generation (E)..... 235
Rapid-writing telegraph system, a new (R) 24
Rated speed of electric motors as affecting the type to be employed, by H. M. Hobart*..... 555
Recent advances in electrochemistry..... 480
Rectifiers, by Charles F. Burgess..... 319
Reduction of fire hazards in electric plants (R)..... 957
Reduction phenomena produced by the action of alternating currents..... 874
Regulation of alternators, the (E)..... 649
Regulator, an electric (R)..... 568
Regulator for electric circuits (P)*..... 303
Regulator for vapor lamp (P)*..... 220
Relative fire-risk of oil and air-blast transformers, by E. W. Rice, Jr..... 439
Remote control switchboard, a (R)..... 879
Removable contact finger tip (P)*..... 635
Remuneration of the engineer, the (E)..... 534
Renting motors (E)..... 349
Reply from Dr. Kershaw, a..... 876
Report of commissioner of education..... 284
Report of the chief of the bureau of navigation, navy department..... 242
Report of the executive committee of the railway test commission..... 789
Repulsion motor, the (R)..... 991
Research in national development, the place of..... 514
Researches on the three-phase arc (R)..... 371
Restoring faded thermometers (E)..... 201
Résumé of our knowledge of the physical properties of current-bearing matter, by Paul R. Heyl*..... 517
Return of the fan motor, the (E)..... 385
Reversible galvanic battery (P)*..... 562
Reversible rotary snow plow (P)*..... 264
Review of the storage battery industry for 1903, by Edward Lyndon..... 70
Review of the year, by William Hand Browne, Jr..... 39
Rheostat (P)*..... 743
Riedler-Stumpf steam turbine, the (R)..... 371
Rœntgen rays and the γ-rays of radium (R)..... 523
Rotary electric tube furnace (P)*..... 703
Rubber, imports of India, into the United States..... 976
Rubber insulation..... 509
Rubber insulation..... 548
Rubber, reduction of the export tax on..... 976
Rural telephone produce exchange..... 775

S

Sad-iron, electric (P)*..... 485
Safeguards and regulations in operation of overhead distributing systems, by W. C. L. Eglin*..... 20
Safety fuse or cutout (P)*..... 877
Selenium cell for the photo-telephone, the (R) 396
Shawinigan Falls power plant, additions to the (R)..... 371
Shocks from high-tension cables (E)..... 649
Shopping by telephone..... 653
Shop testing of motors and generators for commercial service, by B. B. Abry*..58, 102
Should technical cases be tried before ordinary juries? (R)..... 846
Shunt motors for railway work (E)..... 717
Siberia, the export and domestic issue of the ELECTRICAL REVIEW in..... 259
Sibley Journal of Mechanical Engineering, the 6
Signal clock wanted, a..... 442
Signaling system at the Consolidated Exchange, New York, a new*..... 842
Signaling system for ships (R)..... 749
Simultaneous telegraphy and telephony..... 330
Single-phase electric traction (E)..... 3
Single-phase series motor in its relation to existing railway systems (R)..... 305
Single-phase induction motor, the, by W. S. Franklin*..... 916
Single-phase motor design*..... 723
Single-phase repulsion motors, by William Cramp*..... 298
Single *versus* multiphase generators in alternating-current railway work, by W. A. Blanck*..... 588
Sixtieth anniversary of the telegraph, the*.. 874
"Slaves of the lamp"..... 504
Small fire in subway damages cables..... 604
Small gas engines compared with electric motors (R)..... 704
Small incandescent lamps, a method for manufacturing (P)*..... 845
Snoqualmie Falls and White river power transmission plant, Washington, by F. C. Perkins*..... 951
Society of Chemical Industry, the..... 159
Some applications of the theory of electrolysis to the separation of metals from one another, by H. Holland*..... 327
Some remarks upon the causes of breakdowns in electric motor installations (R) 748
Sources of energy and their importance..... 136
Spain, electrical machinery for..... 250
Spanish hematite ore for the United States.. 110
Spanish war veterans to hold a military athletic tournament..... 181
Specifications for producing a man (E)..... 466
Speed-torque characteristics of the single-phase repulsion motor, by W. I. Slichter*. 213
Speed variation of continuous-current motors by shunt control (R)..... 24
Speed variation of shunt motors (E)..... 1
Speed variation of shunt motors, by E. R. Knowles*..... 193
Standardization of construction, by F. C. Polk 10
Starting machines for electrical winding engines..... 69
Statement concerning the manufacture of incandescent lamps, a..... 502
Statistics of the electrical industries (E).... 969
Steam and internal combustion engine compared for central station work, by Norman McCarty*..... 182
Steam pipe coverings*..... 986
Steam turbines, notes on..... 438
Steam turbine propulsion for marine purposes 661
Steam turbine with isothermal expansion, a. 567
Steel cars for the subway (E)..... 235
Steel furnace at Gysinge, Sweden, the electric, by F. A. Kjellin*..... 503
Sterilization of water by ozone (R)..... 25
Stevens Institute of Technology, commencement exercises at..... 983
Stockholm's electric tramways..... 135
Stoning the automobile (E)..... 857
Storage batteries, a new negative plate for (R) 370
Storage batteries, care and management of, by Edward Lyndon*..131, 169, 201, 249, 287, 317
Storage battery construction (P)*..... 635
Street railways..... 676
Street railway statistics..... 566
Structure of the atom (E)..... 465
Study of the primary of an induction coil by means of Hospitalier's ondograph... 938
Submarine mines, electrically operated, by Waldon Fawcett*..... 906
Suggestions for producing high-frequency currents, and some of their phenomena, by Edwin F. Northrup and Elliott Woods*.....442, 469
Summer school for artisans, a..... 570
Sun spot changes and their dangerous electrostatic influences upon chemical explosives and inflammable gases..... 170
Swiss electric railroading, by Franz Koster*. 353
Switch, a new electrical (P)*..... 79
Switch for series arc circuit (P)*..... 335
Switch houses (E)..... 718
Switzerland, development of electric power in (R)..... 152

T

Tachymeter, an electrical (R)..... 568
Taming the thunderbolt (E)..... 684
Tanneries, electric power in, by George E. Walsh*..... 289
Telegraph system in Argentine Republic..... 335
Telegraphy, present conditions in, by Francis W. Jones..... 52
Telephone appreciated, the (E)..... 810
Telephone arithmetic..... 861
Telephone building in Trinidad, Col., new*... 862
Telephone engineering, by J. C. Kelsey*.. 536, 585, 619, 687, 777, 869
Telephonic communication between England and France..... 621
Telephone industry, the (E)..... 499
Telephone in Europe, the (E)..... 581
Telephone in Nova Scotia..... 633
Telephone in 1903, the, by C. J. H. Woodbury 50
Telephone on German railways, the..... 102
Telephone on trolley cars..... 292
Telephone pad support (P)*..... 220
Telephonic printing (E)..... 969
Telephone situation in England, the (E)..... 651
Telephone transmission, improvement in (R) 80
Telephoning over tracks to a moving train, the possibilities of (E)..... 200
Telephony in Germany..... 722
Temperature of osmium lamps..... 400
Temperature indicating system (P)*..... 792
Terminals and bushings for high-pressure transformers, by W. S. Moody..... 440
Terrestrial magnetism..... 827
Test for induction motor windings, a, by G. H. Garcelon..... 549
Test of a 4,000-horse-power turbo-generator.. 158
Tests of steam locomotives on the Marienfelde-Zossen line..... 926
Testing large alternators (R)..... 221
That stream of bullets (E)..... 719
Thawing frozen water pipes..... 526
Theoretical basis for the experimental predetermination of the regulation of alternators*..... 725
Thermal effect and practical utility of superheated steam, the (A)..... 879
The *Electrical Magazine*..... 291
The *Engineering Press Monthly Index Review* 559
The *Marine Review*..... 492
The *Michigan Technic*..... 949
The *Suburbanite*..... 799
The *Technical World*..... 450
The *Trade Press List*..... 508
Thermostat, an electric..... 6
Thomas S. Clarkson Memorial School of Technology, the..... 574
Three-phase phenomenon, a..... 938
Three-wire, five-hundred-volt, lighting system, a, by Walter I. Barnes..... 836
Tin scrap recovery processes, by J. B. C. Kershaw..... 939
Trackless railway in Prussia..... 875
Traction system, new electric (R)..... 336
Train-lighting system, a new..... 192
Transactions of the American Society of Mechanical Engineers..... 239
Transformation of thermochemical energy into voltaic energy or electromotive force (R)..... 221
Transformer (P)*..... 669
Transformer fire hazard, the (E)..... 500
Transmission of energy by means of gas (E) 581
Transmitter (P)*..... 302
Transportable substation, by A. Steens*..... 479
Trinidad, Col., new telephone building in*... 862
Tube lamp, electric (P)*..... 562
Tufts engines, the..... 110
Turbines, low-pressure steam (E)..... 935
Twenty-thousand-volt transmission plant, a (R)..... 543
Type foundry, the electrical equipment of a modern*..... 977

U

Unbalanced attraction on the rotor of induction motors (R)..... 396
Underground Electric Railway Company, of London, the..... 668

Underground telegraph lines in England.... 273
Uni-directional wireless telegraphy..... 102
Union Engineering Building, the.....631, 668
United Press to be revived, the..... 662
Unscientific electric engineering (R)..... 188
Unusual accident, an (E)..... 616
Use of nickel in the core of the Marconi magnetic detector, the (R)..... 749
Use of radium in hospitals, the..... 675

V

Value of manual training, the (R)..... 153
Variation of electrical resistance due to light, the (R)..... 221
Variable electric speed gearing..... 298
Verbs needed..... 477
Veterans at the convention of the National Electric Light Association*..... 873
Vienna, Austria, municipal light and power plant, by Franz Koster*..... 44
Vibrating device for induction coils, by F. W. Barker..... 63
Villiers and Edison..... 355
Visitors to the first electric light convention at Boston*..... 873
Vogt gas engine, the (R)..... 188

W

Wanted, a good igniter (E)..... 93
Warsaw electric exhibition..... 608
Water heater (P)*..... 520
Water heater (P)*..... 601
Water-power development..... 747
Water power in Germany..... 845
Water-power installations, two large (R).... 487
Water power of the Rhine..... 787
Water softening (R)..... 116
Washington, D. C., telephone rates..... 661
Wave-length of N-rays, the (E)..... 281
Way to balance the plates of a Wimshurst electrical machine, the, by J. M. Blake.. 827
Watt anniversary, the..... 284
Westinghouse company's Baltimore office, new location of..... 246
What inducements to enter "light current engineering" are held out to technical students? by Joseph B. Baker..... 245
What Manchester, England, is doing for engineering apprentices (R)..... 748
White Star steamer Baltic's electrical equipment, the new, by G. E. Walsh..... 583
Wimshurst electrical machines, the way to balance the plates of a, by J. M. Blake 827
Winding a railway motor armature, by H. D. Robertson*..... 740
Wind pressure on telegraph structures (R).. 24
Wireless news service across the Yellow sea, by Julius Chambers*..... 547
Wireless signaling system (P)*..... 563
Wireless signaling system (P)*..... 924
Wireless telegraph patent, a..... 983
Wireless telegraphy..... 488
Wireless telegraphy (E)..... 533
Wireless telegraph war service..... 660
Wireless telegraphy, a new receiver for (R).. 956
Wireless telegraphy and its use in nautical work..... 298
Wireless telegraphy in Brazil..... 357
Wireless telegraphy, naval control of (E).... 858
Wireless telegraphy, reporting the Gordon Bennett race by..... 983
Wireless telephony (R)..... 266
Wire station, electric (P)*..... 703
Wires and the weather (E)..... 315
Women in the telegraphic and telephonic service in Germany..... 212
Worcester Polytechnic Institute.....291, 900
World's copper production, the..... 488
World's Fair Bulletin for January, the..... 173
World's Fair, electricity at the*..... 893
World's Fair, the (E)..... 892

X

X-light, notes on, by William Rollins....63, 136, 209, 324, 901
X-light tube, new form of..... 902
X-ray tube for generating bi-ultra violet rays and X-rays in combination, by Dr. J. Mount Bleyer*..... 982

Y

Yorkshire Electric Power Company's generating station, the*.....67, 284

Z

Zero weather and water powers..... 202

AUTHORS OF ARTICLES IN VOL. XLIV OF THE ELECTRICAL REVIEW

Adams, Alton D., Guard Wires for Transmission Lines..... 106
Calculation of Transmission Lines..... 236
Abry, B. B., Shop Testing of Motors and Generators for Commercial Service*..58, 102
Armstrong, A. H., Some Possibilities of the Alternating-Current, Single-Phase, Railway Motor*..... 111
Arnold, E. J., A Letter..... 12
Badt, F. B., The Grounding of Secondaries.. 299
Baker, Joseph B., Major Wireless Telegraph Progress for the Year 1903..... 73
Minor Wireless Telegraph Progress for the Year 1903..... 400
What Inducements to Enter "Light Current Engineering" Are Held Out to Technical Students? 245
Bannon, Joseph, News from Mexico..361, 564, 593
Barker, F. W., Vibrating Device for Induction Coils..... 63
Barnes, H. H. Jr., Notes on Flywheels..... 781
Barnes, Walter I., A Three-Wire, Five-Hundred-Volt Lighting System..... 836
Bechtel, E. J., Automatic Apparatus for Regulating Generator and Feeder Potentials* 19
Bell, Dr. Louis, Electric Traction in 1903... 49
Bibbins, J. R., Gas Power for Central Stations* 60
Bignami, Enrico, The Hydroelectric Station of Champ*..... 538
Blake, J. M., The Way to Balance the Plates of a Wimshurst Electrical Machine..... 827
Blanck, W. A., Single *versus* Multiphase Generators in Alternating-Current Railway Work* 588
Bleyer, Dr. J. Mount, An X-Ray Tube for Producing Bi-Ultra Violet and X-Rays in Combination* 982
Bowden, G. H., Electrical Transmission of Power as an Aid to Greater Economy in Works and Factories..... 330
Browne, Jr., William Hand, Review of the Year 39
Burgess, Charles F., Rectifiers..... 319
Burgess, C. F., and Carl Hambuechen, Electrolytic Iron..... 689
Carhart, Henry S., American Electrochemical Society 357
Carhart, H. S., and G. A. Hulett, Preparation of Materials for Standard Cells and Their Construction*..... 590
Chambers, Julius, Wireless News Service Across the Yellow Sea..... 547
Clarke, W. B., Electrical Mining Notes..... 357
Cramp, William, Single-Phase Repulsion Motors 298
Crapper, Ellis H., Methods of Charging for Electrical Energy..... 109
Damon, George A., The Opportunities in the Electrical Business..... 481
Davis, W. H., Dissociation by Means of the Alternating Electric Current..... 626
Dick, W. A., Direct-Current Systems of Electric Drive..... 944
Durand, C. L., The Progress of Electrical Development in Europe in 1903..... 70
The French Automobile Show*..... 175
Electrical Notes from Europe....260, 560, 914
A Large, Modern Paris Generating Plant* 828
Eastman, G. N., The Advisability and Methods of Grounding the Neutral on High-Potential Alternating-Current Generators* 903
Eborall, A. C., Electric Traction with Alternating Currents*..... 133
Edgar, C. L., Some Notes on Electric Lighting 41
Eglin, W. C. L., Safeguards and Regulations in Operation of Overhead Distributing Systems* 20
Ewing, J. A., and L. H. Walter, A New Method of Detecting Electrical Oscillations* 467
Fawcett, Waldon, Professor Bell and His Kites* 779
Electrically Operated Submarine Mines*.. 906
Franklin, W. S., The Single-Phase Induction Motor* 916
Garcelon, G. H., A Test for Induction Motor Windings 549
Gin, Gustave, The Electrical Manufacture of Steel*.....617, 651
Gradenwitz, Dr. A., The Berlin Teletyping Central Station*..... 553
Guarini, Emile, An Electric Pumping Station for the Kimberley Mines*..... 243
The Electrical Mining Installations of the Helios Electrical Company*..... 386
Hambuechen, Carl, and C. F. Burgess, Electrolytic Iron..... 689
Hewlett, E. M., Oil Switches for High Pressures 440
Heyl, Paul R., A Résumé of Our Knowledge of the Physical Properties of Current-Bearing Matter*..... 517
Hobart, H. M., The Rated Speed of Electric Motors as Affecting the Type to Be Employed* 555
Hobart, H. M., and F. Punga, A Contribution to the Theory of the Regulation of Alternators* 664, 691
Hobble, A. C., Electrical Notes from India... 942
Holland, A., Some Applications of the Theory of Electrolysis to the Separation of Metals from One Another*..... 327
Howes, Robert, A One-Hundred-Mile Transmission Line..... 833
Hulett, G. A., and H. S. Carhart, Preparations of Material for Standard Cells and Their Construction* 590
Humphrey, C. W., Lost and Unaccounted-for Current 864
Jones, Francis W., Present Conditions in Telegraphy 52
Kelsey, J. C., Telephone Engineering*..536, 585, 619, 687, 777, 869
Kershaw, J. B. C., Industrial Electrochemistry and Electrometallurgy..5, 53, 103, 137, 171, 205, 248, 292, 325
Special Report of the Eleventh Annual Meeting of the German Society of Electrochemists 919

AUTHORS OF ARTICLES IN VOL. XLIV OF THE ELECTRICAL REVIEW—Continued

Tin Scrap Recovery Processes*..... 939
Kjellin, F. A., The Electric Steel Furnace at Gysinge, Sweden..... 503
Knowles, E. R., Speed Variation of Shunt Motors* 193
Loft Buildings—Electrical Power Desirable 515
Knowlton, H. S., Increasing the Use of Electric Automobiles..... 728
Koster, Franz, The Vienna, Austria, Municipal Light and Power Plant*..... 44
Swiss Electric Railroading*..... 353
Hydroelectric Power Plant at Zwolfmalgrien, in Tyrol, Austria*..... 505
The Electrical and Mechanical Equipment of a Modern European Theatre..... 729
Lamme, B. G., Data and Tests on a 10,000-Cycle-per-Second Alternator*..... 839
Lanphear, B. S., Electric Power for Railways 285
Leonard, F. H., Jr., Electrical Equipment for Cornwall Canal..... 909
Lloyd, Morton Githens, Translation from *Zeitschrift fur Instrumentenkunde*, of Accurate Measurement of Small Resistances with the Kelvin Double Bridge*... 4, 64, 96
Lodian, L., Telegraphy in Ciberia*..... 594
Lowther, H. F., Radioactive Phenomena.... 662
Lyndon, Edward, Review of the Storage Battery Industry for 1903....70, 131, 169, 201, 249, 287, 317
McCarty, Norman, Steam and Internal Combustion Engines Compared for Central Station Work*..... 182
Marlow, W. C., The Electrical Equipment of a Food Conservatory*..... 54
Maynard, George C., The Naval Observatory's New Year's Greeting to the World..... 42
Merrick, F. L., Around the Intra-Mural..... 546
Mershon, Ralph D., The Gas Engine for Central Station Service*..... 392
Moody, W. S., Terminals and Bushings for High-Pressure Transformers..... 440
Newbury, F. D., The Alternating-Current Series Motor..... 203
Northrup, Edwin F., and Elliott Woods, Suggestions for Producing High-Frequency Currents, and Some of Their Phenomena* 442, 469
The National Bureau of Standards..... 146
Odell, W., Preliminary Experiments on Air Friction* 142
Perkins, Frank C., Photographing Alternating-Current Waves with the New Duddell Oscillograph*..... 7
The New Station at Dartmouth, England* 172
High-Tension Hydroelectric Plants in Roumania and Switzerland*..... 321
Snoqualmie Falls and White River Power Transmission Plant, Washington*..... 951
Polk, F. C., Standardization of Construction 10
Potter, Henry Noel, The Problem of Improving Electric Lamps..... 763
Price, J. E., Power Plans for the Great Falls of the Potomac..... 501
Punga, F., and H. W. Hobart, A Contribution to the Theory of the Regulation of Alternators 664, 691
Rice, Jr., E. W., Relative Fire-Risk of Oil and Air-Blast Transformers..... 439
Richards, J. W., The Applications of Electricity to Metallurgy..... 735
Riggs, A. S., Manila's Telephone Service and Conditions..... 943
Robertson, H. D., Winding a Railway Motor Armature* 740
Rollins, William, Notes on X-Light*.....63, 136, 209, 324, 901, 947
Ryan, H. J., Conductivity of the Atmosphere at High Voltages*.....362, 402
Scheffler, F. A., Electric Locomotives..... 954
Schott, W. H., Central Station Heating..... 254
Semenza, Guido, European Practice in the Construction and Operation of High-Pressure Transmission Lines and Insulators 394
Sheldon, Samuel, A Few Experiments with Holtz Machines*..... 251
Shepardson, George D., The Electrostatic Capacity of Wires*..... 973
Siggers, E. G., Electrical Patents in 1903*.. 151
Sjostedt, E. A., Electric Smelting Experiments for the Manufacture of Ferro-Nickel from Pyrrhotite* 720
Slichter, W. J., Speed-Torque Characteristics of the Single-Phase Repulsion Motor.... 213
Steens, A., Transportable Substation*..... 479
Steinmetz, Charles P., The Alternating-Current Railway Motor*.....215, 262
Stillwell, L. B., The Use of Group Switches in Large Power Stations..... 439
Sullivan, M. C., Electrical Anemometry in the Sea Coast Artillery Service*..... 449
Thomas, P. H., Cooper Hewitt Mercury Vapor Lamp 446
Thomas, R. D., The New Richmond Roller Mills Power Development*..... 654
Thornton, W. M., Experiments on Eddy Currents* 167, 211
Trowbridge, John, The Progress of Electricity During 1903..... 76
Underhill, Charles R., and Richard Varley, Coil Windings for Electrical Purposes*.. 256
Varley, Richard, and Charles R. Underhill, Coil Windings for Electrical Purposes..* 256
Walker, Sydney F., Electrical Mining Notes.. 104, 148, 351, 399, 788
Walsh, George E., Electric Power in Tanneries 289
The New White Star Steamer Baltic's Electrical Equipment..... 583
Walter, L. H., and J. A. Ewing, A New Method of Detecting Electrical Oscillations* 467
Warren, Arthur, The Promotion of Business.. 407
Waters, W. L., Predetermination of Sparking in Direct-Current Machines*..... 824
Weedon, W. S., A Contribution to the Study of the Electrical Arc*..... 622
Whitehead, J. B., The N-Rays..... 433
Woodbury, C. J. H., The Telephone in 1903.. 50
Woods, Elliott, and Edwin F. Northrup, Suggestions for Producing High-Frequency Currents and Some of Their Phenomena* 442, 469
Zimmerman, C. I., The Aluminum Electrolytic Condenser* 657
Hydraulic Analogy of the Aluminum Electrolytic Condenser*..... 660